Design Resource

Wrought Iron Craft - Nagpur, Maharashtra

Traditional Metal Craft

by
Prof. Bibhudutta Baral and Srikanth B.
NID, Bengaluru

Source:
https://www.dsource.in/resource/wrought-iron-craft-nagpur-maharashtra

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Introduction

Iron is the fourth most abundant element on earth, occupying more than 5% of the earth's crust. Obtained from iron ore, it is formed naturally in sedimentary rocks. Iron ore, also known as ironstone, holds varying amounts of other elements as well such as silicon, sulfur, manganese, and phosphorus. Wrought iron derived from iron alloy is a soft, ductile, and fibrous variety suitable for forging or rolling rather than casting due to its low carbon content. The word 'wrought' is a past participle of the verb 'to work' and hence wrought iron stands for 'worked iron'. During the 17th to 19th century, wrought iron was known in various names based on its forms, origin, and its quality, while in the 20th century, it was set to use for building decorative items like iron railings, doors, balconies, grilles, and other exterior fittings.

Wrought usually contains less than 0.1 percent carbon and 1 to 2 percent slag, hence favorable for most purposes than cast iron, which is overly brittle owing to its high carbon content. Wrought iron is manufactured by the puddling of cast iron. This involves heating cast iron and manually mixing air in with the molten mass. The process of smelting iron from its oxides in a furnace is called the Bloomery process. Here bloomery is the name for the equipment or a type of furnace used to treat the iron. In this process, cast iron is heated with charcoal on a one-to-one ratio. At this point, enough air is blown in through a nozzle to heat the elements to a temperature somewhat below the melting point of iron. Adding charcoal fosters to reduce the ore to iron, with the help of carbon monoxide formed in the reaction, which eventually separates iron and slag. This gives bloom, a spongy byproduct made of mixed iron and slag. This attained bloom is then again heated to be beaten with a hammer to drive out slag. This is an important step as the raw bloom is highly porous, and its open spaces are heavily filled with slag. These steps are repeated multiple times until it holds the least percent of carbon and slag. Iron treated this way is called wrought iron or bar iron. The wrought iron usually contains around 0.02% to 0.08% carbon, thus making the metal stronger and malleable.

Decorative items made out of wrought iron are in great demand nationally as well as at international markets; hence there are many manufacturers and laborers across the country putting in hard efforts to create this absolute masterpiece. One such manufacturer is New Handicrafts from Nagpur, started by Mr. Nitesh and Mr. Santosh in 2010. With the backing of 25 skilled artisans, the company is a leading entity in the manufacturing, wholesale, and supply of antique metal statues and various types of traditional and contemporary wall hangings.

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The building of New Handicraft Company.

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New Handicraft Company's board explaining the details about their work.

Mr. Nithesh Hiwrall, the owner cum craftsman of the company.

Mr. Santosh Mendhe, one of the owners cum craftsman of the company.

The whole team of New Handicraft Company.

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Tools and Raw Materials

Following are the tools and raw material required for Wrought Iron Craft:

- **Wrought Iron:** It is the primary material for this craft.
- **Hammer:** This is used for beating the iron sheets to obtain the preferred shape.
- **Welding Gun:** It is essential to blow fire to wield the iron.
- **Gas Cylinder:** The gas cylinder is connected to the welding gun to produce a flame.
- **Lighter:** It is used to generate a flame.
- **Cutting Plier:** It is used for cutting and meandering the iron.
- **Measurement Scale:** It measures various materials like wrought iron sheets or the sculpture etc.
- **Metal Buffing Brush:** It is a buffing tool used to offer smooth surfaces to the sculpture.
- **Angle Grinding Machine:** It is a handheld power tool used for grinding (abrasive cutting) and polishing.
- **Power Drilling Machine:** It is a handheld power tool used for drilling holes.
- **Spray Gun:** It is used to spray paint the objects with preferred colours.
- **Red Oxide Primer:** This primer is applied to protect the metal surfaces from corrosion, along with a rich look, coverage, and leveling properties.
- **Black Enamel:** It is the base colour given to the sculptures.
- **Colour Paints and Metallic Paints:** Different types of colour paints and metallic paints are used over areas that are expected to stand out.
- **Paint Brushes:** These are essential for applying the colours the right way.
- **Adhesive:** It is used for sticking sculptures onto the frame.

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- **Drawing Paper:** Figures to be sculpted are first drawn on drawing paper.
- **Pencil:** It is used for drawing.
- **Metal Cutter:** It is used for cutting metal sheets.

A ball-peen hammer used to emboss the iron sheet.

A nose plier was used to support the rod while welding.

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Cutting plier, a multi-purpose tool.

Gas welding torch connected to two gas hoses, one of the hose realizes LPG while the other oxygen.

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Esdee Syncoat is a synthetic enamel, or in simple words, an oil paint applied to protect iron sheets from rusting. This also gives black colour to the objects, generally used for automobiles.

Thinner is used to dilute the paint.

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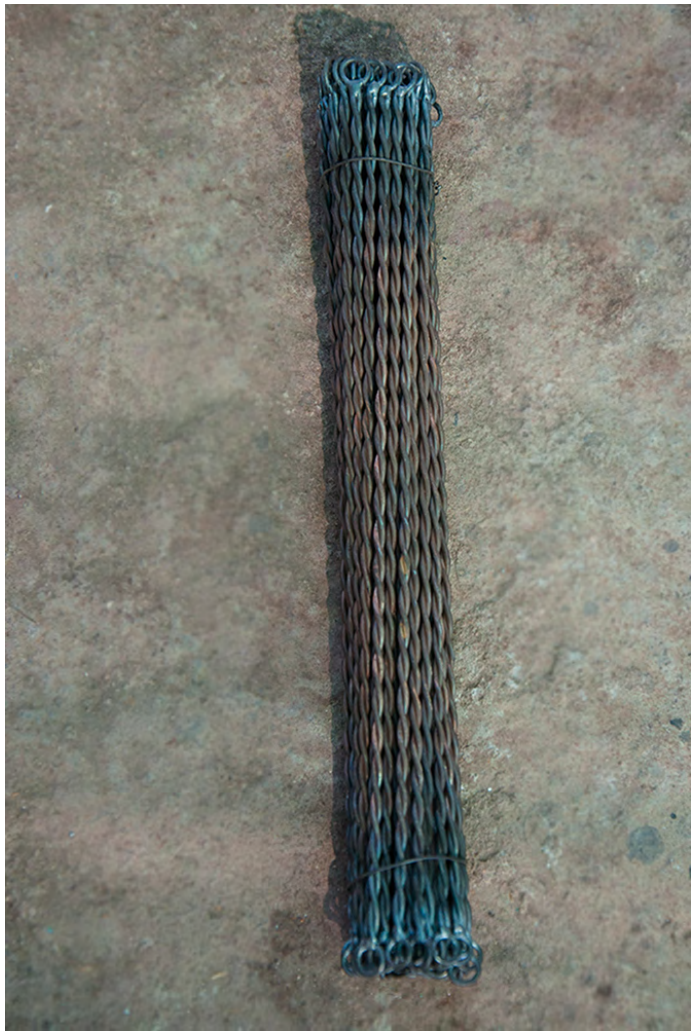

Rods used to design the iron sheet craft.

Pencil used to sketch the design of the craft.

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Oxygen cylinder, used for gas welding.

Cross-and straight peen hammer.

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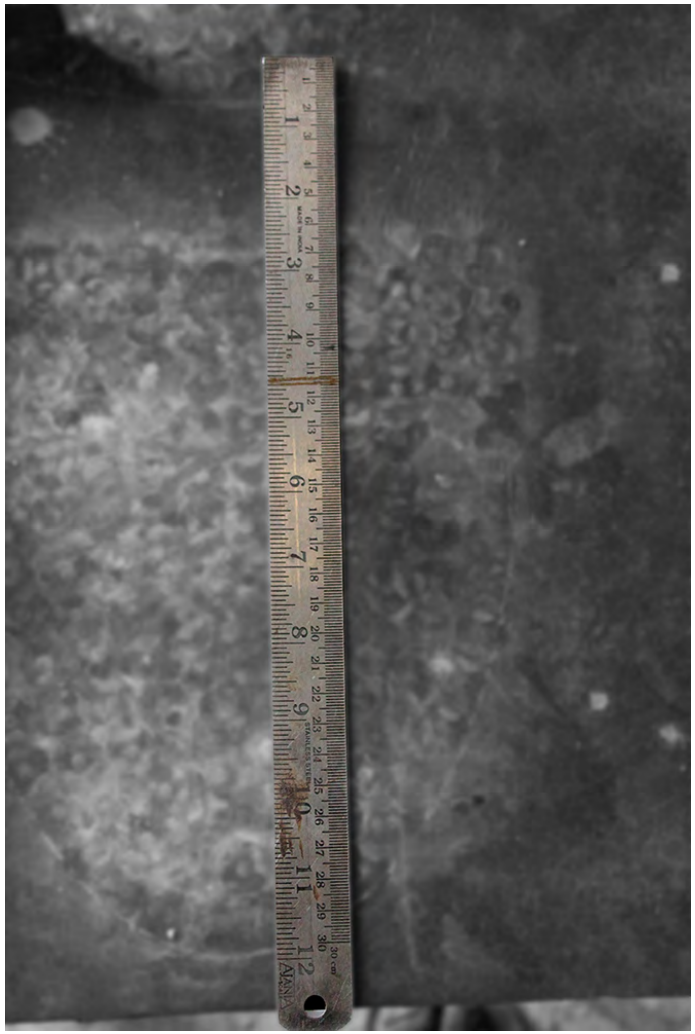
Iron sheets.



A metal ruler is used to measure the length.

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A rotating table is used while spray painting the craft.

Wooden base, used as a base table for molding the craft conveniently.

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Colourful paints and brushes are used to paint the crafts.

Brazing salt, used in welding that helps achieve a strong joint between two metal pieces.

A buffing machine is used to smoothen the metal surfaces.

Paint spray gun.

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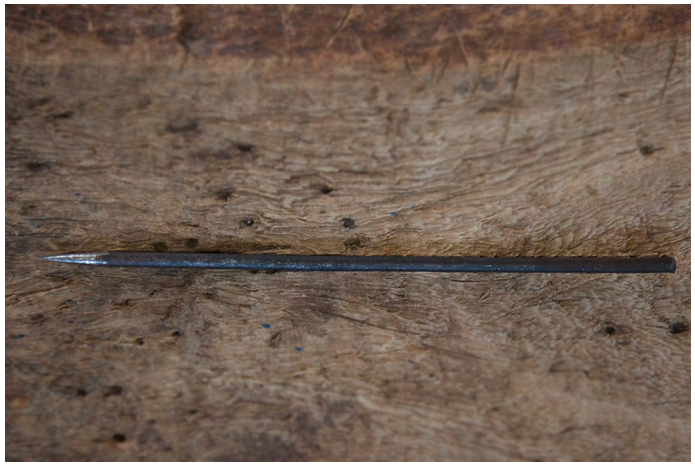
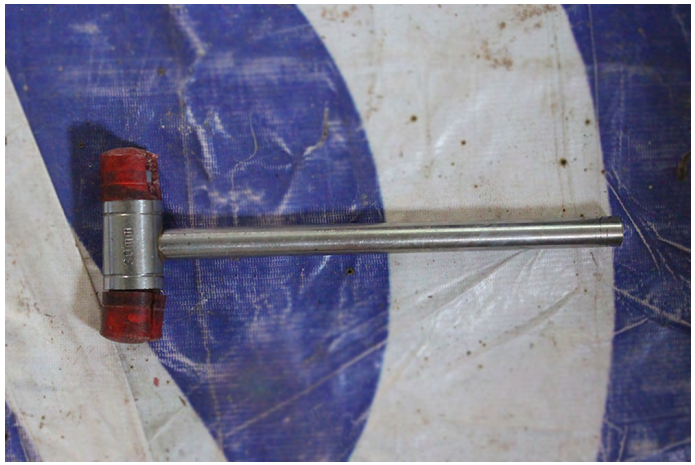
Sketching materials.

Shape stencil is used to mark multiple similar shapes on the metal sheet.

The marker helps to mark shapes on the metal sheet.



A soft face fiber hammer is used to emboss the sheet metal into the required shape.

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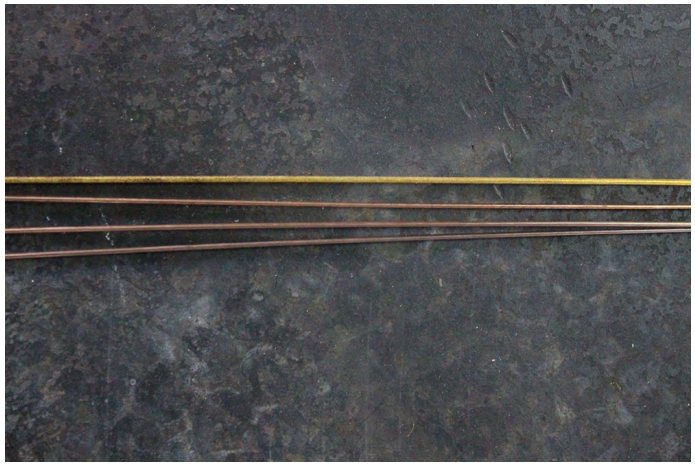
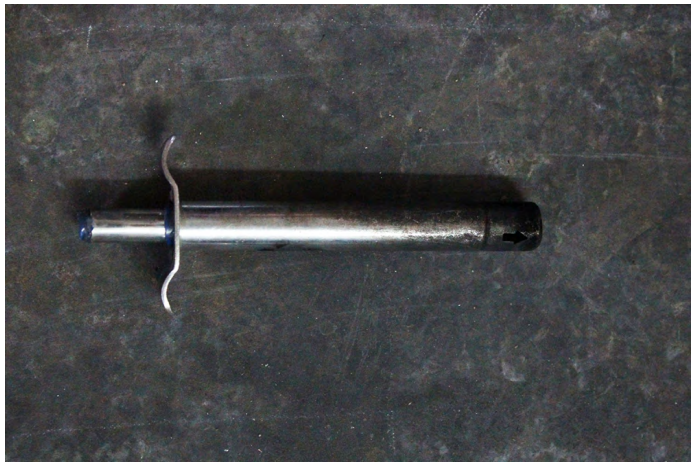


Thin metal rods are the additional pieces that go into making the craft.



Lighter used to light gas welding.

A grinding machine is used to remove excess pieces from the craft after welding.

Superglue, applied over the craft to mold it easily on a wooden base.

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Metal sheet cutter.

Air compressor, used for spray painting.

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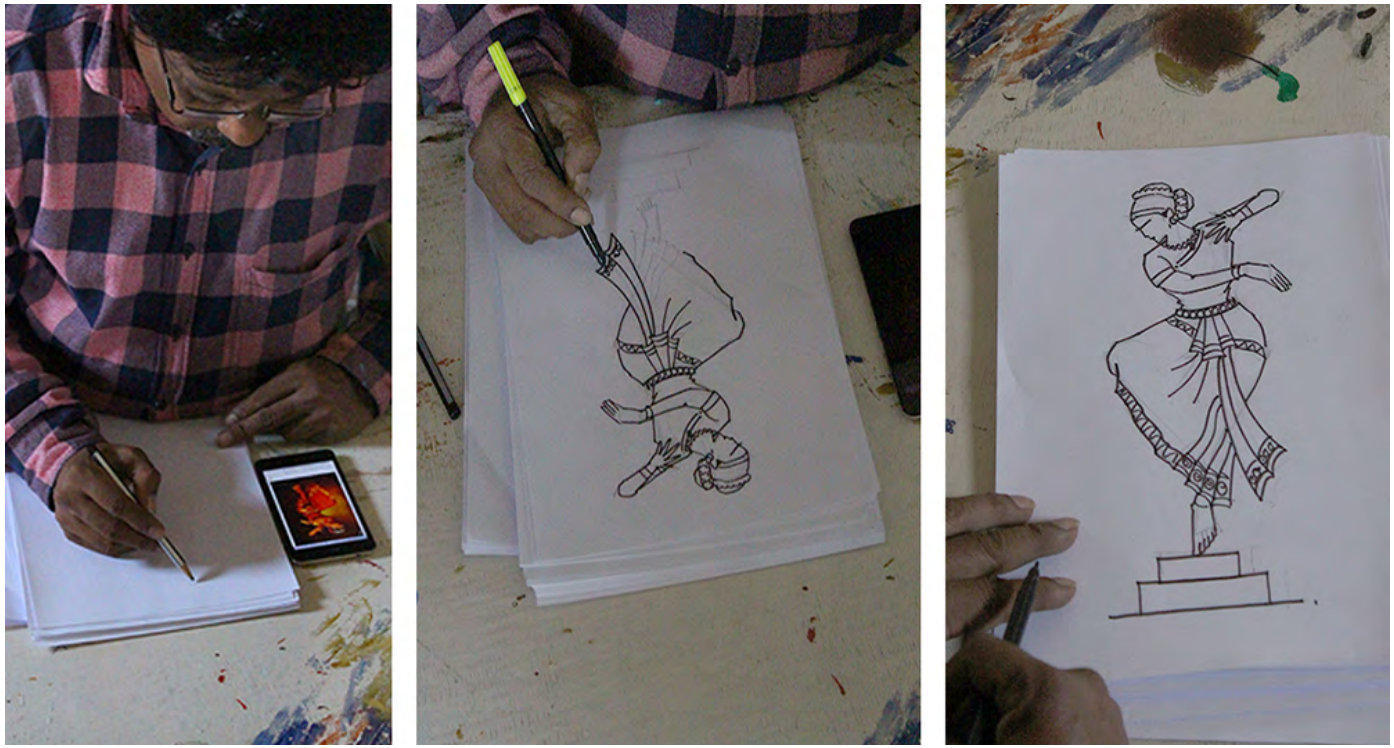
Making Process

The main raw material here is Wrought iron, with the following chemical composition; Iron 99-99.8%, Carbon- 0.05-0.25%; Manganese- 0.01-0.1%; Sulphur- 0.02-0.1%; Phosphorus- 0.05-0.2%; Silicon- 0.02-0.2%. Then the process goes step by step as stated below. Firstly, the artisan draws desired figures on a drawing paper that are chosen for sculpting. Then place the stencil design over the wrought iron sheets, drawn shapes are cut using a metal cutter. With the help of a hammer, the artisan strikes the cut-sheets to get a 2D appeal and embossing style. These different pieces are then assembled and welded together to achieve the expected figure. After this stage, a metal buffing brush and angle grinding machine are set to use for smoothening the ends and certain internal parts. Red oxide is spray-painted on the finished figures that protect the metal from corrosion and give a rich look to the craft. Followed by black enamel paint as a base colour over the remaining areas. After the base colour is dried, it is up to the artisan to decide whether to use other shades of paints or not, wherever required. Artisan often prefers to paint the ornaments of the sculptures with shimmering metallic paints. These sculptures are then let to dry and finally sold to customers.



An artist is sketching the product/craft.

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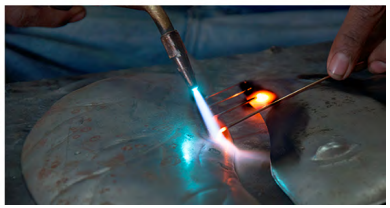
A stencil is used to mark designs on a metal sheet.

The marked pieces being cut down using a cutter.

The flat pieces being embossed by ball-peen hammer and soft-faced hammer.



All the embossed pieces being welded together.

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After the welding process, the extra pieces are being removed using the grinding process.

Then the craft is buffed for smooth surfaces.

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A layer of red oxide is being applied to prevent corrosion.

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After the base coat, the artists doing a detailed painting with multiple colours.

Artisan drilling the wooden base for support and background for the product.

The craftsman molding the craft to the wooden base.

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Products

New Handicrafts, a wrought iron craft manufacturer based in Nagpur, makes sculptures of sizes starting from 5 inches to 20 feet. Here the product prices range from INR 200 to INR 1,00,000, depending on the size and design of the sculpture.

The set of eye-catching colours used over sculptures of Flutists, Mridangam artist, and a Tanpura player.

Sculpture of Lord Buddha, an epitome of peace, non-violence, and dharma.

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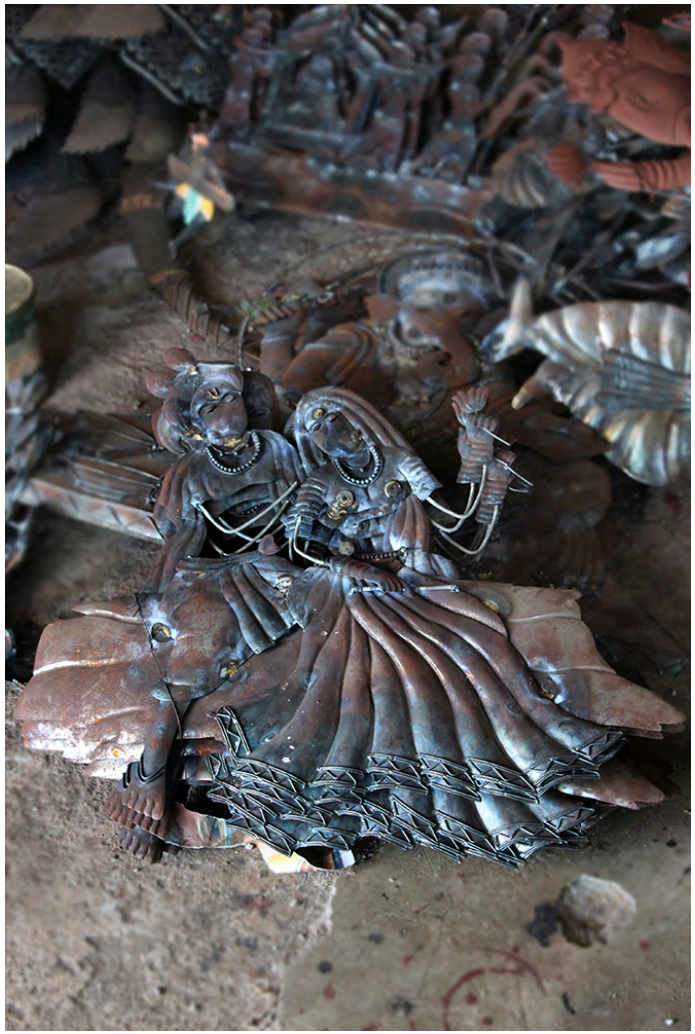

A glimpse of a Lord Krishna and Radha sculpture which is in its making process.

A Mridangam artist craftwork that presents a warm blend of colours.

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Sculpture of Lord Ganesh.

Lord Ganesh iron craft, before and after the base coat.

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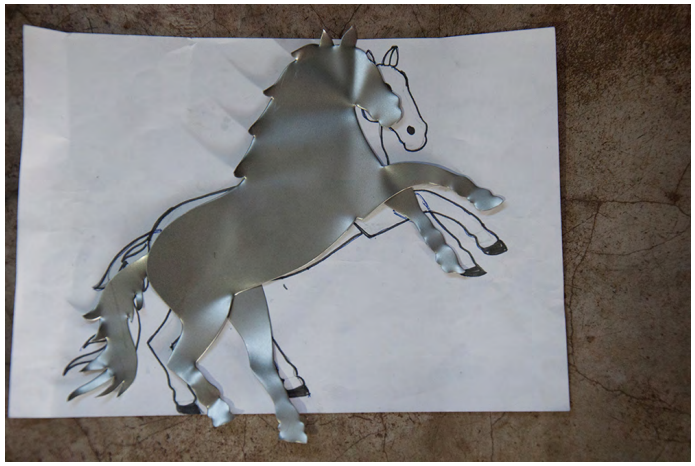
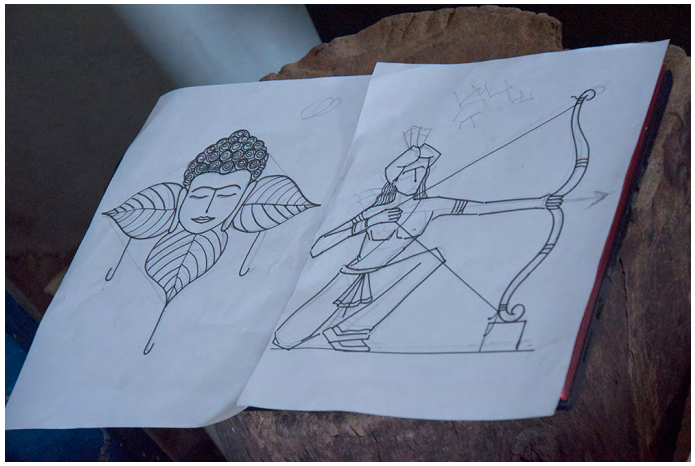
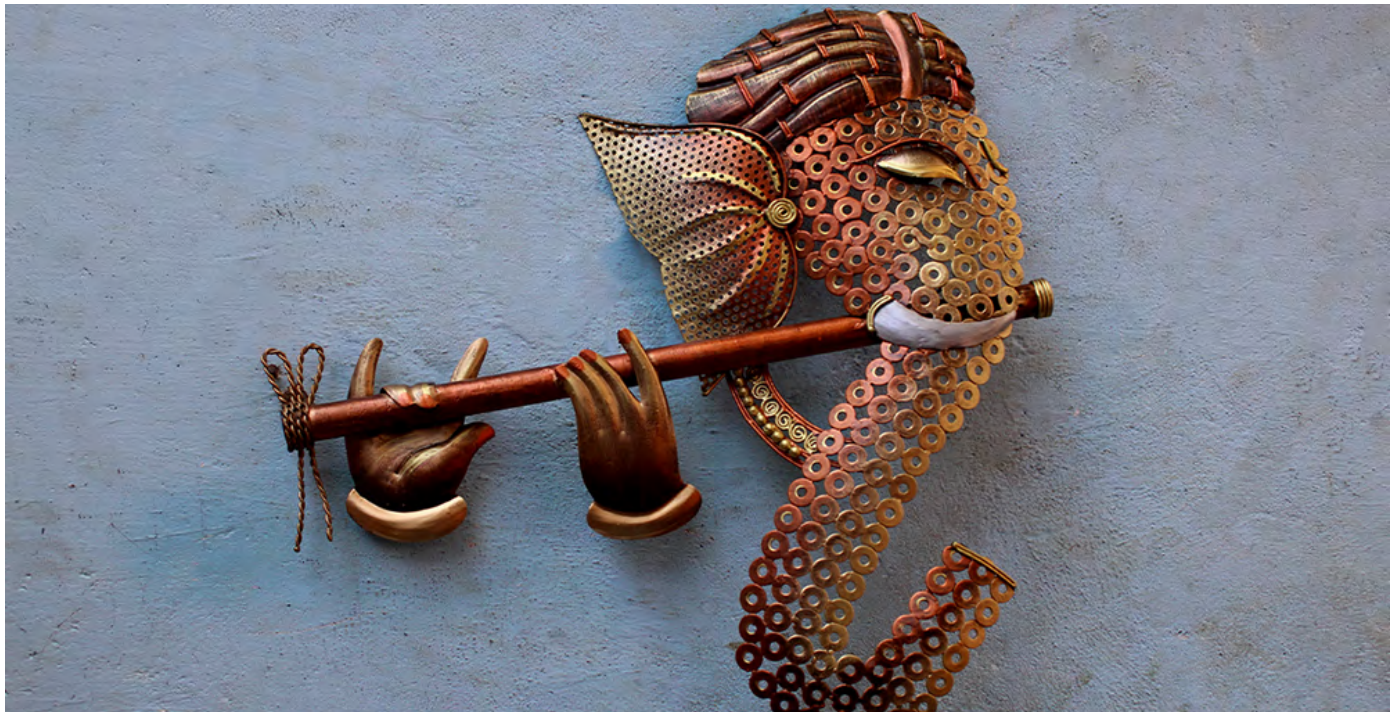


Cut pieces of a Mustang according to its desired design.



The artist's imagination is represented on a paper showing Lord Buddha and Lord Ram.



A Lord Ganesh iron craft playing the flute.

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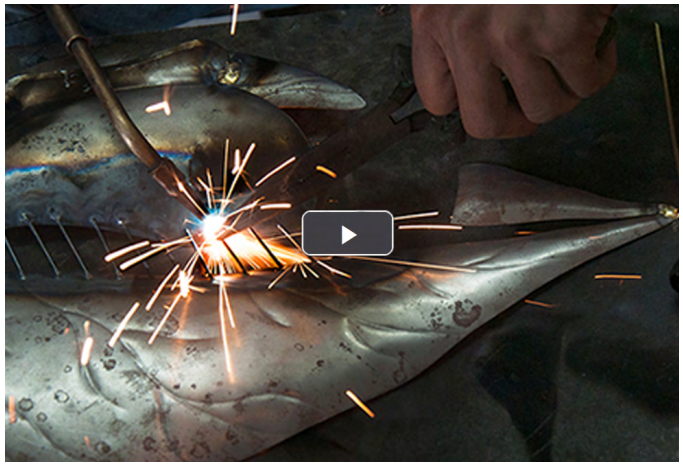

Wrought Iron Craft - Nagpur - Part 1

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This documentation was done by Professor Bibhudutta Baral and Srikanth B. at NID, Bengaluru.

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